SEQUENCE LISTING

<110> Nielsen, J
Pedersen, J.
Gerwien, J.
Bay, K.
Pedersen, L.
Leist, M.
Geist, M.
Kallunki, P.
Christensen, S.
Sager, T.
Brines, M.
Cerami, A.
Cerami, C.

<120> RECOMBINANT TISSUE PROTECTIVE CYTOKINES AND ENCODING NUCLEIC ACIDS THEREOF FOR PROTECTION, RESTORATION, AND ENHANCEMENT OF RESPONSIVE CELLS, TISSUES AND ORGANS

<130> 10165-022-999

<140> 10/612,665
<141> 2003-07-01

<150> 60/392,455
<151> 2002-07-01

<150> 60/393,423
<151> 2002-07-03

<160> 211

<170> PatentIn version 3.2

<210> 1
<211> 5
<212> PRT
<213> Homo sapiens

<400> 1

Val Leu Gln Arg Tyr
1 5

<210> 2
<211> 8
<212> PRT
<213> Homo sapiens

<400> 2

Thr Lys Val Asn Phe Tyr Ala Trp
1 5

<210> 3
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3

Ser Gly Leu Arg Ser Leu Thr Thr Leu
1 5

<210> 4
<211> 6
<212> PRT
<213> Homo sapiens

<400> 4

Ser Asn Phe Leu Arg Gly
1 5

<210> 5
<211> 6059
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: plasmid

<400> 5
ctagagtcga cccgggcggc cgcttccctt tagtgagggt taatgcttcg agcagacatg 60

ataagataca ttgatgagtt tggacaaacc acaactagaa tgcagtgaaa aaaatgcttt 120

atttgtgaaa tttgtgatgc tattgcttta tttgtaacca ttataagctg caataaacaa 180

gttaacaaca acaattgcat tcattttatg tttcaggttc agggggagat gtgggaggtt 240

ttttaaagca agtaaaacct ctacaaatgt ggtaaaatcc gataaggatc gatccgggct 300

ggcgtaatag cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg 360

gcgaatggac gcgccctgta gcggcgcatt aagcgcggcg ggtgtggtgg ttacgcgcag 420

cgtgaccgct acacttgcca gcgccctagc gcccgctcct ttcgctttct tcccttcctt 480

tctcgccacg ttcgccggct ttccccgtca agctctaaat cgggggctcc ctttagggtt 540

ccgatttagt gctttacggc acctcgaccc caaaaaactt gattagggtg atggttcacg 600

tagtgggcca tcgccctgat agacggtttt tcgcccttg acgttggagt ccacgttctt 660

taatagtgga ctcttgttcc aaactggaac aacactcaac cctatctcgg tctattcttt 720

tgatttataa gggattttgc cgatttcggc ctattggtta aaaaatgagc tgatttaaca 780

aaaatttaac gcgaatttta acaaaatatt aacgcttaca atttcctgat gcggtatttt 840

ctccttacgc atctgtgcgg tatttcacac cgcatacgcg gatctgcgca gcaccatggc 900

ctgaaataac ctctgaaaga ggaacttggt taggtacctt ctgaggcgga aagaaccagc 960

tgtggaatgt gtgtcagtta gggtgtggaa agtccccagg ctccccagca ggcagaagta 1020

tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca ggctccccag 1080

caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc ccgcccctaa 1140

ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc catggctgac 1200

taatttttt tatttatgca gaggccgagg ccgcctcggc ctctgagcta ttccagaagt 1260

agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gcttgattct tctgacacaa 1320

cagtctcgaa cttaaggcta gagccaccat gattgaacaa gatggattgc acgcaggttc 1380

tccggccgct tgggtggaga ggctattcgg ctatgactgg gcacaacaga caatcggctg 1440

ctctgatgcc gccgtgttcc ggctgtcagc gcaggggcgc ccggttcttt ttgtcaagac 1500

cgacctgtcc ggtgccctga atgaactgca ggacgaggca gcgcggctat cgtggctggc 1560

cacgacgggc gttccttgcg cagctgtgct cgacgttgtc actgaagcgg gaagggactg 1620

gctgctattg ggcgaagtgc cggggcagga tctcctgtca tctcaccttg ctcctgccga 1680

gaaagtatcc atcatggctg atgcaatgcg gcggctgcat acgcttgatc cggctacctg 1740

cccattcgac caccaagcga aacatcgcat cgagcgagca cgtactcgga tggaagccgg 1800

tcttgtcgat caggatgatc tggacgaaga gcatcagggg ctcgcgccag ccgaactgtt 1860

cgccaggctc aaggcgcgca tgcccgacgg cgaggatctc gtcgtgaccc atggcgatgc 1920

ctgcttgccg aatatcatgg tggaaaatgg ccgcttttct ggattcatcg actgtggccg 1980

gctgggtgtg gcggaccgct atcaggacat agcgttggct acccgtgata ttgctgaaga 2040

gcttggcggc gaatgggctg accgcttcct cgtgctttac ggtatcgccg ctcccgattc 2100

gcagcgcatc gccttctatc gccttcttga cgagttcttc tgagcgggac tctggggttc 2160

gaaatgaccg accaagcgac gcccaacctg ccatcacgat ggccgcaata aaatatcttt 2220

attttcatta catctgtgtg ttggtttttt gtgtgaatcg atagcgataa ggatccgcgt 2280

atggtgcact ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc 2340

gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 2400

agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 2460

cgcgagacga aagggcctcg tgatacgcct atttttatag gttaatgtca tgataataat 2520

ggtttcttag acgtcaggtg gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt 2580

atttttctaa atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct 2640

tcaataatat tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc 2700

ctttttgcg gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa 2760

agatgctgaa gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg 2820

taagatcctt gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt 2880

tctgctatgt ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg 2940

catacactat tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac 3000

ggatggcatg acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc 3060

ggccaactta cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa 3120
catgggggat catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc 3180
aaacgacgag cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt 3240
aactggcgaa ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga 3300
taaagttgca ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa 3360
atctggagcc ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa 3420
gccctcccgt atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa 3480
tagacagatc gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt 3540
ttactcatat atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt 3600
gaagatcctt tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg 3660
agcgtcagac cccgtagaaa agatcaaagg atcttcttga gatccttttt ttctgcgcgt 3720
aatctgctgc ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca 3780
agagctacca actcttttte cgaaggtaac tggcttcagc agagcgcaga taccaaatac 3840
tgttcttcta gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac 3900
atacctcgct ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct 3960
taccgggttg gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg 4020
gggttcgtgc acacagccca gcttggagcg aacgacctac accgaactga gatacctaca 4080
gcgtgagcta tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt 4140
aagcggcagg gtcggaacag gagagcgcac gagggagctt ccagggggaa acgcctggta 4200
tctttatagt cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc 4260
gtcaggggg cggagcctat ggaaaaacgc cagcaacgcg gccttttac ggttcctggc 4320
cttttgctgg ccttttgctc acatggctcg acagatcttc aatattggcc attagccata 4380
ttattcattg gttatatagc ataaatcaat attggctatt ggccattgca tacgttgtat 4440
ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc atgttggcat 4500
tgattattga ctagttatta atagtaatca attacggggt cattagttca tagcccatat 4560
atggagttcc gcgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac 4620
ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 4680
cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 4740
tatcatatgc caagtccgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 4800
tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta cgtattagtc 4860
atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg atagcggttt 4920

gactcacggg gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac 4980

caaaatcaac gggactttcc aaaatgtcgt aacaactgcg atcgcccgcc ccgttgacgc 5040

aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctcgt ttagtgaacc 5100

gtcagatcac tagaagcttt attgcggtag tttatcacag ttaaattgct aacgcagtca 5160

gtgcttctga cacaacagtc tcgaacttaa gctgcagtga ctctcttaag gtagccttgc 5220

agaagttggt cgtgaggcac tgggcaggta agtatcaagg ttacaagaca ggtttaagga 5280

gaccaataga aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct 5340

attggtctta ctgacatcca ctttgccttt ctctccacag gtgtccactc ccagttcaat 5400

tacagctctt aaggctagag tacttaatac gactcactat aggctagcct cgagcgcgga 5460

gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 5520

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga 5580

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg 5640

cagcttgaat gagaatatca ctgtcccaga caccgacgtt aatttctatg cctggaagag 5700

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 5760

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct 5820

gcatgtggat aaagccgtcg agggccttcg cagcctcacc actctgcttc gggctctgcg 5880

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 5940

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct 6000

gaagctgtac acaggggagg cctgcaggac aggggaccat catcaccatc accattgat 6059

<210> 6
<211> 193
<212> PRT
<213> Homo sapiens

<400> 6

```
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1               5                  10                  15
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
            20                  25                  30
Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
        35                  40                  45
Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
    50                  55                  60
Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65                  70                  75                  80
Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
                85                  90                  95
Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
            100                 105                 110
Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
        115                 120                 125
Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
```

130 135 140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145 150 155 160
Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
165 170 175
Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
180 185 190
Arg

<210> 7
<211> 580
<212> DNA
<213> Homo sapiens

<400> 7
atgggggtgc acgaatgtcc tgcctggctg tggcttctcc tgtccctgct gtcgctccct 60

ctgggcctcc cagtcctggg cgccccacca cgcctcatct gtgacagccg agtcctggag 120

aggtacctct tggaggccaa ggaggccgag aatatcacga cgggctgtgc tgaacactgc 180

agcttgaatg agaatatcac tgtcccagac accaaagtta atttctatgc ctggaagagg 240

atggaggtcg ggcagcaggc cgtagaagtc tggcagggcc tggccctgct gtcggaagct 300

gtcctgcggg gccaggccct gttggtcaac tcttcccagc cgtgggagcc cctgcactgc 360

atgtggataa agccgtcagt ggccttcgca gcctcaccac tctgcttcgg gctctgggag 420

cccagaagga agccatctcc cctccagatg cggcctcagc tgctccactc cgaacaatca 480

ctgctgacac tttcgcaaac tcttccgagt ctactccaat ttcctccggg gaaagctgaa 540

gctgtacaca ggggaggcct gcaggacagg ggacagatga 580

<210> 8
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 8
agctctcgag gcgcggagat gggggtgcac gaatg 35

<210> 9
<211> 36
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 9
atgctctaga cacacctggt catctgtccc ctgtcc 36

<210> 10

<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 10
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 11
<211> 45
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 11
catgtggata aagccgtcga gggccttcgc agcctcacca ctctg 45

<210> 12
<211> 45
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 12
cagagtggtg aggctgcgaa ggccctcgac ggctttatcc acatg 45

<210> 13
<211> 45
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 13
gagaatatca ctgtcccaga caccgacgtt aatttctatg cctgg 45

<210> 14
<211> 45
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 14
ccaggcatag aaattaacgt cggtgtctgg gacagtgata ttctc 45

<210> 15
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 15
Ala Pro Pro Arg Leu Ala Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 16
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 16
Ala Pro Pro Arg Leu Ile Ala Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30

```
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 17
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 17
Ala Pro Pro Arg Leu Ile Cys Asp Ser Ile Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 18
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 18
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Ser Leu Glu Arg Tyr Leu
```

```
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 19
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 19

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Ala Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 20
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 20
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Ala Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 21
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 21
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Ala Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 22
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 22
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 23
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 23
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Glu Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 24

<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 24
```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Gln Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 25
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 25
```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Ala Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 26
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 26
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Phe Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 27
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 27
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Ile Leu
 1   5   10   15
Leu Glu Ala Glu Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala

145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 28
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 28
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Glu Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 29
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 29
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Ala Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125

```
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 30
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 30
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Ala Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 31
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 31
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Lys Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
```

100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 32
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 32
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Ser Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 33
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 33
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Tyr Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80

```
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 34
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 34

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Asn Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 35
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 35

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu Thr
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
```

50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 36
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 36
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Ser Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 37
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 37
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30

```
Tyr Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 38
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 38

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Lys Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 39
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 39

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
```

```
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Lys Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 40
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 40

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Asn Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 41
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 41
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Ala Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 42
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 42
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Ala Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 43
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 43
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Ile Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 44
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 44
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Asp Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 45

<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 45
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Ala Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 46
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 46
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Ala Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 47
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 47
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Ala Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 48
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 48
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Ile
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala

145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 49
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 49
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Ala
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 50
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 50
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Ala Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125

```
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 51
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 51
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Ser Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 52
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 52
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Phe Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
```

```
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 53
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 53

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Asn Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 54
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 54

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Ala Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
```

```
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 55
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 55

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Asn Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 56
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 56

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Thr Val Trp
```

```
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 57
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 57

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Ser Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 58
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 58

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
```

```
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Ala Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 59
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 59

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Arg
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 60
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 60

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
```

```
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Ala Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 61
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 61

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Arg Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 62
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 62
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Glu Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 63
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 63
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ala Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 64
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 64
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Thr Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 65
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 65
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Ala Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 66

<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 66
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Ile Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 67
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 67
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Ala Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 68
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 68
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Ala Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 69
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 69
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Glu Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala

145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 70
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 70
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ala Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 71
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 71
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ile Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125

```
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 72
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 72
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Ala Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 73
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 73
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Ala Thr Leu Leu Arg Ala Leu
```

```
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 74
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 74

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Ile Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 75
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 75

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
```

```
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Ala Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 76
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 76

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Leu Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 77
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 77

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
```

```
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Lys Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 78
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 78
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Ala Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 79
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 79
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
```

```
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Ser Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 80
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 80
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Ala Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 81
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 81
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
```

```
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ala Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 82
<211> 193
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 82

```
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1               5                  10                  15
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
            20                  25                  30
Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
        35                  40                  45
Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
    50                  55                  60
Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65                  70                  75                  80
Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
                85                  90                  95
Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
            100                 105                 110
Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
        115                 120                 125
Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
    130                 135                 140
Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Ala Ile
145                 150                 155                 160
Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
                165                 170                 175
Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
            180                 185                 190
Arg
```

<210> 83
<211> 166
<212> PRT

<213> Artificial Sequence

<220>
<223> mutein

<400> 83
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ala Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 84
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 84
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Ala Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 85
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 85
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Ala Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 86
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 86
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Ile Arg Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg

165

<210> 87
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 87
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Ala Val
130 135 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 88
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 88
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140

```
Tyr Ala Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 89
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 89

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Lys Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 90
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 90

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
```

```
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Ala Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 91
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 91

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Tyr Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 92
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 92

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
```

```
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Ala Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 93
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 93
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Ala Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 94
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 94
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
```

65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Ala Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 95
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 95
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Glu Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 96
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 96
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45

```
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Ala Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 97
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 97
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Ala Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 98
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 98
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
```

```
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Trp Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 99
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 99

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Ala Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 100
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 100

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Ala Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 101
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 101

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Ala Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 102
<211> 166
<212> PRT
<213> Artificial Sequence

<220>

<223> mutein

<400> 102
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Ala Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 103
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 103
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Ser Arg Thr Gly Asp Arg
                165

<210> 104
<211> 166
<212> PRT

<213> Artificial Sequence

<220>
<223> mutein

<400> 104
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Ala Arg Thr Gly Asp Arg
                165

<210> 105
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 105
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Ala Thr Gly Asp Arg
                165

<210> 106
<211> 165
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 106
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Glu His Cys
            20   25   30
Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Asp Val Asn Phe Tyr
        35   40   45
Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln
    50   55   60
Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu
65   70   75   80
Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys
                85   90   95
Ala Val Glu Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly
            100   105   110
Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro
        115   120   125
Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr
    130   135   140
Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys
145   150   155   160
Arg Thr Gly Asp Arg
                165

<210> 107
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 107
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Asn Glu Thr
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg

165

<210> 108
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 108
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Asp Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140
Tyr Ser Asn Phe Leu Glu Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145 150 155 160
Cys Arg Thr Gly Asp Arg
165

<210> 109
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 109
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
1 5 10 15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
20 25 30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
35 40 45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
50 55 60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65 70 75 80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
85 90 95
Lys Ala Val Ser Gly Leu Glu Ser Leu Thr Thr Ser Leu Arg Ala Leu
100 105 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
115 120 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
130 135 140

```
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 110
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 110

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Ala Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Ala Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 111
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 111

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Ala Val Asn Phe
        35                  40                  45
Tyr Ala Trp Ala Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
```

```
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Ala Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 112
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 112

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 113
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 113

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
```

```
Ala Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Ala Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 114
<211> 193
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 114

```
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1               5                  10                  15
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
            20                  25                  30
Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
        35                  40                  45
Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
    50                  55                  60
Asn Ile Thr Val Pro Asp Thr Ala Val Asn Phe Tyr Ala Trp Lys Arg
65                  70                  75                  80
Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
                85                  90                  95
Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
            100                 105                 110
Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Ala Ala Val Ser Gly
        115                 120                 125
Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
    130                 135                 140
Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145                 150                 155                 160
Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
                165                 170                 175
Arg Gly Ala Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
            180                 185                 190
Arg
```

<210> 115
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 115

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Ala Val Asn Phe
```

```
        35                  40                  45
Tyr Ala Trp Ala Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Ala Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Ala Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Ala Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 116
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 116
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Ala Val Asn Phe
        35                  40                  45
Tyr Ala Trp Ala Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Ala Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Ala Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Ala Leu Ala Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165


<210> 117
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 117
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu
 1               5                  10                  15
```

```
Leu Glu Ala Lys Glu Ala Glu Lys Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Lys Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Lys Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 118
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 118

```
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Ala Leu
 1               5                  10                  15
Leu Glu Ala Lys Glu Ala Glu Lys Ile Thr Thr Gly Cys Ala Glu His
            20                  25                  30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35                  40                  45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50                  55                  60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65                  70                  75                  80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85                  90                  95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100                 105                 110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115                 120                 125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130                 135                 140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145                 150                 155                 160
Cys Arg Thr Gly Asp Arg
                165
```

<210> 119
<211> 166
<212> PRT
<213> Artificial Sequence

<220>
<223> mutein

<400> 119
Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Ala Ala Leu
 1   5   10   15
Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His
            20   25   30
Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe
        35   40   45
Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp
    50   55   60
Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu
65   70   75   80
Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp
                85   90   95
Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu
            100   105   110
Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala
        115   120   125
Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val
    130   135   140
Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala
145   150   155   160
Cys Arg Thr Gly Asp Arg
                165

<210> 120
<211> 36
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 120
gtctactcca atttcctcga gggaaagctg aagctg 36

<210> 121
<211> 34
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 121
gcttcagctt tccctcgagg aaattggagt agac 34

<210> 122
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 122
ccgtcagtgg ccttgagagc ctcaccactc tg 32

<210> 123
<211> 32

<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 123
cagagtggtg aggctctcaa ggccactgac gg 32

<210> 124
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 124
ccgtcagtgg ccttgagagc ctcaccactc tg 32

<210> 125
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 125
cagagtggtg aggctctcaa ggccactgac gg 32

<210> 126
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 126
cgcagcctca ccacttcgct tcgggctctg g 31

<210> 127
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 127
ccagagcccg aagcgaagtg gtgaggctgc g 31

<210> 128
<211> 40
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 128
gaatatcact gtcccagacg gtggtgcctg gaagaggatg 40

<210> 129
<211> 40
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 129
catcctcttc caggcaccac cgtctgggac agtgatattc 40

<210> 130
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 130
tacctcttgg aggccgcgga ggccgagaat atc 33

<210> 131
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 131
gatattctcg gcctccgcgg cctccaagag gta 33

<210> 132
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 132
gctgacactt tccgcgcact cttccgagtc tactc 35

<210> 133
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 133
gagtagactc ggaagagtgc gcggaaagtg tcagc 35

<210> 134
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 134
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 135
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 135
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 136
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 136
ctccggggaa agctggcgct gtacacaggg ga 32

<210> 137
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 137
tcccctgtgt acagcgccag ctttccccgg ag 32

<210> 138
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 138
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 139
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 139
caggcataga aattaactgc ggtgtctggg acagt 35

<210> 140
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 140
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 141
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 141
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 142
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 142
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 143
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 143
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 144
<211> 32

<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 144
ctctgggagc ccaggcggaa gccatctccc ct 32

<210> 145
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 145
aggggagatg gcttccgcct gggctcccag ag 32

<210> 146
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 146
gctgacactt tccgcgcact cttccgagtc tactc 35

<210> 147
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 147
gagtagactc ggaagagtgc gcggaaagtg tcagc 35

<210> 148
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 148
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 149
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 149
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 150
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 150
gctgacactt tccgcgcact cttccgagtc tactc 35

<210> 151
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 151
gagtagactc ggaagagtgc gcggaaagtg tcagc 35

<210> 152
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 152
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 153
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 153
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 154
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 154
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 155
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 155
caggcataga aattaactgc ggtgtctggg acagt 35

<210> 156
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 156
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 157
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 157
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 158
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 158
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 159
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 159
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 160
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 160
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 161
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 161
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 162
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 162
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 163
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 163
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 164
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 164
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 165
<211> 35

<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 165
caggcataga aattaactgc ggtgtctggg acagt 35

<210> 166
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 166
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 167
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 167
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 168
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 168
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 169
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 169
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 170
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 170
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 171
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 171
caggcataga aattaactgc ggtgtctggg acagt 35

<210> 172
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 172
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 173
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 173
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 174
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 174
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 175
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 175
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 176
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 176
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 177
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 177
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 178
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 178
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 179
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 179
caggcataga aattaactgc ggtgtctggg acagt 35

<210> 180
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 180
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 181
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 181
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 182
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 182
gctgacactt tccgcgcact cttccgagtc tactc 35

<210> 183
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 183
gagtagactc ggaagagtgc gcggaaagtg tcagc 35

<210> 184
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 184
tgcagctgca tgtggatgca gccgtcagtg gcc 33

<210> 185
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 185
ggccactgac ggctgcatcc acatgcagct gca 33

<210> 186
<211> 33

<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 186
atttcctccg gggagcgctg aagctgtaca cag 33

<210> 187
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 187
ctgtgtacag cttcagcgct ccccggagga aat 33

<210> 188
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 188
actgtcccag acaccgcagt taatttctat gcctg 35

<210> 189
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 189
caggcataga attaactgc ggtgtctggg acagt 35

<210> 190
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 190
agttaatttc tatgcctggg cgaggatgga ggtcg 35

<210> 191
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 191
cgacctccat cctcgcccag gcatagaaat taact 35

<210> 192
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 192
gctgacactt tccgcgcact cttccgagtc tactc 35

<210> 193
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 193
gagtagactc ggaagagtgc gcggaaagtg tcagc 35

<210> 194
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 194
ctccggggag cgctggcgct gtacacaggg ga 32

<210> 195
<211> 32
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 195
tcccctgtgt acagcgccag cgctccccgg ag 32

<210> 196
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 196
caaggaggcc gagaaaatca cgacgggctg t 31

<210> 197
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 197
acagcccgtc gtgattttct cggcctcctt g 31

<210> 198
<211> 37
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 198
actgcagctt gaatgagaaa atcactgtcc cagacac 37

<210> 199
<211> 37
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 199
gtgtctggga cagtgatttt ctcattcaag ctgcagt 37

<210> 200
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 200
aggccctgtt ggtcaaatct tcccagccgt g 31

<210> 201
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 201
cacggctggg aagatttgac caacagggcc t 31

<210> 202
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 202
atttcctccg gggatggctg aagctgtaca cag 33

<210> 203
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 203
ctgtgtacag cttcagccat ccccggagga aat 33

<210> 204
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 204
agccgagtcc tggaggcggc cctcttggag gccaa 35

<210> 205
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 205
ttggcctcca agagggccgc ctccaggact cggct 35

<210> 206
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 206
agccgagtcc tggagagggc cctcttggag gccaa 35

<210> 207
<211> 35

<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: primer

<400> 207
ttggcctcca agagggccct ctccaggact cggct 35

<210> 208
<211> 6059
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: plasmid

<400> 208
ctagagtcga cccgggcggc cgcttccctt tagtgagggt taatgcttcg agcagacatg 60

ataagataca ttgatgagtt tggacaaacc acaactagaa tgcagtgaaa aaaatgcttt 120

atttgtgaaa tttgtgatgc tattgcttta tttgtaacca ttataagctg caataaacaa 180

gttaacaaca acaattgcat tcattttatg tttcaggttc aggggagat gtgggaggtt 240

ttttaaagca agtaaaacct ctacaaatgt ggtaaaatcc gataaggatc gatccgggct 300

ggcgtaatag cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg 360

gcgaatggac gcgccctgta gcggcgcatt aagcgcggcg ggtgtggtgg ttacgcgcag 420

cgtgaccgct acacttgcca gcgccctagc gcccgctcct ttcgctttct tcccttcctt 480

tctcgccacg ttcgccggct ttccccgtca agctctaaat cgggggctcc ctttagggtt 540

ccgatttagt gctttacggc acctcgaccc caaaaaactt gattagggtg atggttcacg 600

tagtgggcca tcgccctgat agacggtttt tcgccctttg acgttggagt ccacgttctt 660

taatagtgga ctcttgttcc aaactggaac aacactcaac cctatctcgg tctattcttt 720

tgatttataa gggattttgc cgatttcggc ctattggtta aaaaatgagc tgatttaaca 780

aaaatttaac gcgaatttta acaaaatatt aacgcttaca atttcctgat gcggtatttt 840

ctccttacgc atctgtgcgg tatttcacac cgcatacgcg gatctgcgca gcaccatggc 900

ctgaaataac ctctgaaaga ggaacttggt taggtacctt ctgaggcgga aagaaccagc 960

tgtggaatgt gtgtcagtta gggtgtggaa agtccccagg ctccccagca ggcagaagta 1020

tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca ggctccccag 1080

caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc ccgccctaa 1140

ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc catggctgac 1200

taatttttt tatttatgca gaggccgagg ccgcctcggc ctctgagcta ttccagaagt 1260

agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gcttgattct tctgacacaa 1320

cagtctcgaa cttaaggcta gagccaccat gattgaacaa gatggattgc acgcaggttc 1380

tccggccgct tgggtggaga ggctattcgg ctatgactgg gcacaacaga caatcggctg 1440

ctctgatgcc gccgtgttcc ggctgtcagc gcaggggcgc ccggttcttt ttgtcaagac 1500

cgacctgtcc ggtgccctga atgaactgca ggacgaggca gcgcggctat cgtggctggc 1560

cacgacgggc gttccttgcg cagctgtgct cgacgttgtc actgaagcgg gaagggactg 1620

gctgctattg ggcgaagtgc cggggcagga tctcctgtca tctcaccttg ctcctgccga 1680

gaaagtatcc atcatggctg atgcaatgcg gcggctgcat acgcttgatc cggctacctg 1740

cccattcgac caccaagcga aacatcgcat cgagcgagca cgtactcgga tggaagccgg 1800

tcttgtcgat caggatgatc tggacgaaga gcatcagggg ctcgcgccag ccgaactgtt 1860

cgccaggctc aaggcgcgca tgcccgacgg cgaggatctc gtcgtgaccc atggcgatgc 1920

ctgcttgccg aatatcatgg tggaaaatgg ccgcttttct ggattcatcg actgtggccg 1980

gctgggtgtg gcggaccgct atcaggacat agcgttggct acccgtgata ttgctgaaga 2040

gcttggcggc gaatgggctg accgcttcct cgtgctttac ggtatcgccg ctcccgattc 2100

gcagcgcatc gccttctatc gccttcttga cgagttcttc tgagcgggac tctggggttc 2160

gaaatgaccg accaagcgac gcccaacctg ccatcacgat ggccgcaata aaatatcttt 2220

attttcatta catctgtgtg ttggtttttt gtgtgaatcg atagcgataa ggatccgcgt 2280

atggtgcact ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc 2340

gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 2400

agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 2460

cgcgagacga aagggcctcg tgatacgcct atttttatag gttaatgtca tgataataat 2520

ggtttcttag acgtcaggtg gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt 2580

atttttctaa atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct 2640

tcaataatat tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc 2700

ctttttgcg gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa 2760

agatgctgaa gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg 2820

taagatcctt gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt 2880

tctgctatgt ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg 2940

catacactat tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac 3000

ggatggcatg acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc 3060

ggccaactta cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa 3120

catgggggat catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc 3180

aaacgacgag cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt 3240

aactggcgaa ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga 3300
taaagttgca ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa 3360
atctggagcc ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa 3420
gccctcccgt atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa 3480
tagacagatc gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt 3540
ttactcatat atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt 3600
gaagatcctt tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg 3660
agcgtcagac cccgtagaaa agatcaaagg atcttcttga gatccttttt ttctgcgcgt 3720
aatctgctgc ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca 3780
agagctacca actcttttttc cgaaggtaac tggcttcagc agagcgcaga taccaaatac 3840
tgttcttcta gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac 3900
atacctcgct ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct 3960
taccgggttg gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg 4020
gggttcgtgc acacagccca gcttggagcg aacgacctac accgaactga gatacctaca 4080
gcgtgagcta tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt 4140
aagcggcagg gtcggaacag gagagcgcac gagggagctt ccagggggaa acgcctggta 4200
tctttatagt cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc 4260
gtcaggggcg cggagcctat ggaaaaacgc cagcaacgcg gccttttac ggttcctggc 4320
cttttgctgg ccttttgctc acatggctcg acagatcttc aatattggcc attagccata 4380
ttattcattg gttatatagc ataaatcaat attggctatt ggccattgca tacgttgtat 4440
ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc atgttggcat 4500
tgattattga ctagttatta atagtaatca attacggggt cattagttca tagcccatat 4560
atggagttcc gcgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac 4620
ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 4680
cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 4740
tatcatatgc caagtccgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 4800
tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta cgtattagtc 4860
atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg atagcggttt 4920
gactcacggg gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac 4980
caaaatcaac gggactttcc aaaatgtcgt aacaactgcg atcgcccgcc ccgttgacgc 5040
aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctcgt ttagtgaacc 5100

gtcagatcac tagaagcttt attgcggtag tttatcacag ttaaattgct aacgcagtca 5160

gtgcttctga cacaacagtc tcgaacttaa gctgcagtga ctctcttaag gtagccttgc 5220

agaagttggt cgtgaggcac tgggcaggta agtatcaagg ttacaagaca ggtttaagga 5280

gaccaataga aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct 5340

attggtctta ctgacatcca ctttgccttt ctctccacag gtgtccactc ccagttcaat 5400

tacagctctt aaggctagag tacttaatac gactcactat aggctagcct cgagcgcgga 5460

gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 5520

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga 5580

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg 5640

cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag 5700

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 5760

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct 5820

gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctgcg 5880

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 5940

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct 6000

gaagctgtac acaggggagg cctgcaggac aggggaccat catcaccatc accattgat 6059

<210> 209
<211> 6059
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: plasmid

<400> 209
ctagagtcga cccgggcggc cgcttccctt tagtgagggt taatgcttcg agcagacatg 60

ataagataca ttgatgagtt tggacaaacc acaactagaa tgcagtgaaa aaaatgcttt 120

atttgtgaaa tttgtgatgc tattgcttta tttgtaacca ttataagctg caataaacaa 180

gttaacaaca acaattgcat tcattttatg tttcaggttc aggggagat gtgggaggtt 240

ttttaaagca agtaaaacct ctacaaatgt ggtaaaatcc gataaggatc gatccgggct 300

ggcgtaatag cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg 360

gcgaatggac gcgccctgta gcggcgcatt aagcgcggcg ggtgtggtgg ttacgcgcag 420

cgtgaccgct acacttgcca gcgccctagc gcccgctcct ttcgctttct tcccttcctt 480

tctcgccacg ttcgccggct ttccccgtca agctctaaat cgggggctcc ctttagggtt 540

ccgatttagt gctttacggc acctcgaccc caaaaaactt gattagggtg atggttcacg 600

tagtgggcca tcgccctgat agacggtttt tcgcccttg acgttggagt ccacgttctt 660

taatagtgga ctcttgttcc aaactggaac aacactcaac cctatctcgg tctattcttt 720
tgatttataa gggattttgc cgatttcggc ctattggtta aaaaatgagc tgatttaaca 780
aaaatttaac gcgaatttta acaaaatatt aacgcttaca atttcctgat gcggtatttt 840
ctccttacgc atctgtgcgg tatttcacac cgcatacgcg gatctgcgca gcaccatggc 900
ctgaaataac ctctgaaaga ggaacttggt taggtacctt ctgaggcgga aagaaccagc 960
tgtggaatgt gtgtcagtta gggtgtggaa agtccccagg ctccccagca ggcagaagta 1020
tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca ggctccccag 1080
caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc ccgcccctaa 1140
ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc catggctgac 1200
taatttttt tatttatgca gaggccgagg ccgcctcggc ctctgagcta ttccagaagt 1260
agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gcttgattct tctgacacaa 1320
cagtctcgaa cttaaggcta gagccaccat gattgaacaa gatggattgc acgcaggttc 1380
tccggccgct tgggtggaga ggctattcgg ctatgactgg gcacaacaga caatcggctg 1440
ctctgatgcc gccgtgttcc ggctgtcagc gcaggggcgc ccggttcttt ttgtcaagac 1500
cgacctgtcc ggtgccctga atgaactgca ggacgaggca gcgcggctat cgtggctggc 1560
cacgacgggc gttccttgcg cagctgtgct cgacgttgtc actgaagcgg gaagggactg 1620
gctgctattg ggcgaagtgc cggggcagga tctcctgtca tctcaccttg ctcctgccga 1680
gaaagtatcc atcatggctg atgcaatgcg gcggctgcat acgcttgatc cggctacctg 1740
cccattcgac caccaagcga aacatcgcat cgagcgagca cgtactcgga tggaagccgg 1800
tcttgtcgat caggatgatc tggacgaaga gcatcagggg ctcgcgccag ccgaactgtt 1860
cgccaggctc aaggcgcgca tgcccgacgg cgaggatctc gtcgtgaccc atggcgatgc 1920
ctgcttgccg aatatcatgg tggaaaatgg ccgcttttct ggattcatcg actgtggccg 1980
gctgggtgtg gcggaccgct atcaggacat agcgttggct acccgtgata ttgctgaaga 2040
gcttggcggc gaatgggctg accgcttcct cgtgctttac ggtatcgccg ctcccgattc 2100
gcagcgcatc gccttctatc gccttcttga cgagttcttc tgagcgggac tctggggttc 2160
gaaatgaccg accaagcgac gcccaacctg ccatcacgat ggccgcaata aaatatcttt 2220
attttcatta catctgtgtg ttggtttttt gtgtgaatcg atagcgataa ggatccgcgt 2280
atggtgcact ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc 2340
gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 2400
agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 2460
cgcgagacga aagggcctcg tgatacgcct atttttatag gttaatgtca tgataataat 2520

ggtttcttag acgtcaggtg gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt 2580

atttttctaa atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct 2640

tcaataatat tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc 2700

ctttttgcg gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa 2760

agatgctgaa gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg 2820

taagatcctt gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt 2880

tctgctatgt ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg 2940

catacactat tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac 3000

ggatggcatg acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc 3060

ggccaactta cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa 3120

catgggggat catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc 3180

aaacgacgag cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt 3240

aactggcgaa ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga 3300

taaagttgca ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa 3360

atctggagcc ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa 3420

gccctcccgt atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa 3480

tagacagatc gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt 3540

ttactcatat atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt 3600

gaagatcctt tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg 3660

agcgtcagac cccgtagaaa agatcaaagg atcttcttga gatccttttt ttctgcgcgt 3720

aatctgctgc ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca 3780

agagctacca actcttttc cgaaggtaac tggcttcagc agagcgcaga taccaaatac 3840

tgttcttcta gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac 3900

atacctcgct ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct 3960

taccgggttg gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg 4020

gggttcgtgc acacagccca gcttggagcg aacgacctac accgaactga gatacctaca 4080

gcgtgagcta tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt 4140

aagcggcagg gtcggaacag gagagcgcac gagggagctt ccagggggaa acgcctggta 4200

tctttatagt cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc 4260

gtcaggggg cggagcctat ggaaaaacgc cagcaacgcg gccttttac ggttcctggc 4320

cttttgctgg ccttttgctc acatggctcg acagatcttc aatattggcc attagccata 4380

ttattcattg gttatatagc ataaatcaat attggctatt ggccattgca tacgttgtat 4440

ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc atgttggcat 4500

tgattattga ctagttatta atagtaatca attacggggt cattagttca tagcccatat 4560

atggagttcc gcgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac 4620

ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 4680

cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 4740

tatcatatgc caagtccgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 4800

tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta cgtattagtc 4860

atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg atagcggttt 4920

gactcacggg gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac 4980

caaaatcaac gggactttcc aaaatgtcgt aacaactgcg atcgcccgcc ccgttgacgc 5040

aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctcgt ttagtgaacc 5100

gtcagatcac tagaagcttt attgcggtag tttatcacag ttaaattgct aacgcagtca 5160

gtgcttctga cacaacagtc tcgaacttaa gctgcagtga ctctcttaag gtagccttgc 5220

agaagttggt cgtgaggcac tgggcaggta agtatcaagg ttacaagaca ggtttaagga 5280

gaccaataga aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct 5340

attggtctta ctgacatcca ctttgccttt ctctccacag gtgtccactc ccagttcaat 5400

tacagctctt aaggctagag tacttaatac gactcactat aggctagcct cgagcgcgga 5460

gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 5520

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga 5580

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgta atgaaacctg 5640

cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag 5700

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 5760

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct 5820

gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctgcg 5880

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 5940

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct 6000

gaagctgtac acaggggagg cctgcaggac aggggaccat catcaccatc accattgat 6059

<210> 210
<211> 6059
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: plasmid

<400> 210
ctagagtcga cccgggcggc cgcttccctt tagtgagggt taatgcttcg agcagacatg 60

ataagataca ttgatgagtt tggacaaacc acaactagaa tgcagtgaaa aaaatgcttt 120

atttgtgaaa tttgtgatgc tattgcttta tttgtaacca ttataagctg caataaacaa 180

gttaacaaca acaattgcat tcattttatg tttcaggttc aggggagat gtgggaggtt 240

ttttaaagca agtaaaacct ctacaaatgt ggtaaaatcc gataaggatc gatccgggct 300

ggcgtaatag cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg 360

gcgaatggac gcgccctgta gcggcgcatt aagcgcggcg ggtgtggtgg ttacgcgcag 420

cgtgaccgct acacttgcca gcgccctagc gcccgctcct ttcgctttct tcccttcctt 480

tctcgccacg ttcgccggct ttccccgtca agctctaaat cgggggctcc ctttagggtt 540

ccgatttagt gctttacggc acctcgaccc caaaaaactt gattagggtg atggttcacg 600

tagtgggcca tcgccctgat agacggtttt tcgcccttg acgttggagt ccacgttctt 660

taatagtgga ctcttgttcc aaactggaac aacactcaac cctatctcgg tctattcttt 720

tgatttataa gggattttgc cgatttcggc ctattggtta aaaaatgagc tgatttaaca 780

aaaatttaac gcgaatttta acaaaatatt aacgcttaca atttcctgat gcggtatttt 840

ctccttacgc atctgtgcgg tatttcacac cgcatacgcg gatctgcgca gcaccatggc 900

ctgaaataac ctctgaaaga ggaacttggt taggtacctt ctgaggcgga aagaaccagc 960

tgtggaatgt gtgtcagtta gggtgtggaa agtccccagg ctccccagca ggcagaagta 1020

tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca ggctccccag 1080

caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc ccgccctaa 1140

ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc catggctgac 1200

taatttttt tatttatgca gaggccgagg ccgcctcggc ctctgagcta ttccagaagt 1260

agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gcttgattct tctgacacaa 1320

cagtctcgaa cttaaggcta gagccaccat gattgaacaa gatggattgc acgcaggttc 1380

tccggccgct tgggtggaga ggctattcgg ctatgactgg gcacaacaga caatcggctg 1440

ctctgatgcc gccgtgttcc ggctgtcagc gcaggggcgc ccggttcttt ttgtcaagac 1500

cgacctgtcc ggtgccctga atgaactgca ggacgaggca gcgcggctat cgtggctggc 1560

cacgacgggc gttccttgcg cagctgtgct cgacgttgtc actgaagcgg gaagggactg 1620

gctgctattg ggcgaagtgc cggggcagga tctcctgtca tctcaccttg ctcctgccga 1680

gaaagtatcc atcatggctg atgcaatgcg gcggctgcat acgcttgatc cggctacctg 1740

cccattcgac caccaagcga aacatcgcat cgagcgagca cgtactcgga tggaagccgg 1800

tcttgtcgat caggatgatc tggacgaaga gcatcagggg ctcgcgccag ccgaactgtt 1860

cgccaggctc aaggcgcgca tgcccgacgg cgaggatctc gtcgtgaccc atggcgatgc 1920
ctgcttgccg aatatcatgg tggaaaatgg ccgcttttct ggattcatcg actgtggccg 1980
gctgggtgtg gcggaccgct atcaggacat agcgttggct acccgtgata ttgctgaaga 2040
gcttggcggc gaatgggctg accgcttcct cgtgctttac ggtatcgccg ctcccgattc 2100
gcagcgcatc gccttctatc gccttcttga cgagttcttc tgagcgggac tctggggttc 2160
gaaatgaccg accaagcgac gcccaacctg ccatcacgat ggccgcaata aaatatcttt 2220
attttcatta catctgtgtg ttggtttttt gtgtgaatcg atagcgataa ggatccgcgt 2280
atggtgcact ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc 2340
gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 2400
agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 2460
cgcgagacga aagggcctcg tgatacgcct atttttatag gttaatgtca tgataataat 2520
ggtttcttag acgtcaggtg gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt 2580
atttttctaa atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct 2640
tcaataatat tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc 2700
ctttttttgcg gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa 2760
agatgctgaa gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg 2820
taagatcctt gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt 2880
tctgctatgt ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg 2940
catacactat tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac 3000
ggatggcatg acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc 3060
ggccaactta cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa 3120
catgggggat catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc 3180
aaacgacgag cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt 3240
aactggcgaa ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga 3300
taaagttgca ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa 3360
atctggagcc ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa 3420
gccctcccgt atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa 3480
tagacagatc gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt 3540
ttactcatat atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt 3600
gaagatcctt tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg 3660
agcgtcagac cccgtagaaa agatcaaagg atcttcttga gatccttttt ttctgcgcgt 3720

aatctgctgc ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca 3780

agagctacca actcttttc cgaaggtaac tggcttcagc agagcgcaga taccaaatac 3840

tgttcttcta gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac 3900

atacctcgct ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct 3960

taccgggttg gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg 4020

gggttcgtgc acacagccca gcttggagcg aacgacctac accgaactga gatacctaca 4080

gcgtgagcta tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt 4140

aagcggcagg gtcggaacag gagagcgcac gagggagctt ccagggggaa acgcctggta 4200

tctttatagt cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc 4260

gtcagggggg cggagcctat ggaaaaacgc cagcaacgcg gccttttac ggttcctggc 4320

cttttgctgg ccttttgctc acatggctcg acagatcttc aatattggcc attagccata 4380

ttattcattg gttatatagc ataaatcaat attggctatt ggccattgca tacgttgtat 4440

ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc atgttggcat 4500

tgattattga ctagttatta atagtaatca attacggggt cattagttca tagcccatat 4560

atggagttcc gcgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac 4620

ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 4680

cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 4740

tatcatatgc caagtccgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 4800

tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta cgtattagtc 4860

atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg atagcggttt 4920

gactcacggg gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac 4980

caaaatcaac gggactttcc aaaatgtcgt aacaactgcg atcgcccgcc ccgttgacgc 5040

aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctcgt ttagtgaacc 5100

gtcagatcac tagaagcttt attgcggtag tttatcacag ttaaattgct aacgcagtca 5160

gtgcttctga cacaacagtc tcgaacttaa gctgcagtga ctctcttaag gtagccttgc 5220

agaagttggt cgtgaggcac tgggcaggta agtatcaagg ttacaagaca ggtttaagga 5280

gaccaataga aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct 5340

attggtctta ctgacatcca ctttgccttt ctctccacag gtgtccactc ccagttcaat 5400

tacagctctt aaggctagag tacttaatac gactcactat aggctagcct cgagcgcgga 5460

gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 5520

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga 5580

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg 5640

cagcttgaat gagaatatca ctgtcccaga caccgacgtt aatttctatg cctggaagag 5700

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 5760

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct 5820

gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctgcg 5880

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 5940

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct 6000

gaagctgtac acaggggagg cctgcaggac aggggaccat catcaccatc accattgat 6059

<210> 211
<211> 6059
<212> DNA
<213> Artificial

<220>
<223> Description of Artificial Sequence: plasmid

<400> 211
ctagagtcga cccgggcggc cgcttccctt tagtgagggt taatgcttcg agcagacatg 60

ataagataca ttgatgagtt tggacaaacc acaactagaa tgcagtgaaa aaaatgcttt 120

atttgtgaaa tttgtgatgc tattgcttta tttgtaacca ttataagctg caataaacaa 180

gttaacaaca acaattgcat tcattttatg tttcaggttc agggggagat gtgggaggtt 240

ttttaaagca agtaaaacct ctacaaatgt ggtaaaatcc gataaggatc gatccgggct 300

ggcgtaatag cgaagaggcc cgcaccgatc gcccttccca acagttgcgc agcctgaatg 360

gcgaatggac gcgccctgta gcggcgcatt aagcgcggcg ggtgtggtgg ttacgcgcag 420

cgtgaccgct acacttgcca gcgccctagc gcccgctcct ttcgctttct tcccttcctt 480

tctcgccacg ttcgccggct ttccccgtca agctctaaat cgggggctcc ctttagggtt 540

ccgatttagt gctttacggc acctcgaccc caaaaaactt gattagggtg atggttcacg 600

tagtgggcca tcgccctgat agacggtttt tcgcccttg acgttggagt ccacgttctt 660

taatagtgga ctcttgttcc aaactggaac aacactcaac cctatctcgg tctattcttt 720

tgatttataa gggattttgc cgatttcggc ctattggtta aaaaatgagc tgatttaaca 780

aaaatttaac gcgaatttta acaaaatatt aacgcttaca atttcctgat gcggtatttt 840

ctccttacgc atctgtgcgg tatttcacac cgcatacgcg gatctgcgca gcaccatggc 900

ctgaaataac ctctgaaaga ggaacttggt taggtacctt ctgaggcgga aagaaccagc 960

tgtggaatgt gtgtcagtta gggtgtggaa agtccccagg ctccccagca ggcagaagta 1020

tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca ggctccccag 1080

caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc ccgcccctaa 1140

ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc catggctgac 1200

taatttttt tatttatgca gaggccgagg ccgcctcggc ctctgagcta ttccagaagt 1260

agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gcttgattct tctgacacaa 1320

cagtctcgaa cttaaggcta gagccaccat gattgaacaa gatggattgc acgcaggttc 1380

tccggccgct tgggtggaga ggctattcgg ctatgactgg gcacaacaga caatcggctg 1440

ctctgatgcc gccgtgttcc ggctgtcagc gcaggggcgc ccggttcttt ttgtcaagac 1500

cgacctgtcc ggtgccctga atgaactgca ggacgaggca gcgcggctat cgtggctggc 1560

cacgacgggc gttccttgcg cagctgtgct cgacgttgtc actgaagcgg gaagggactg 1620

gctgctattg ggcgaagtgc cggggcagga tctcctgtca tctcaccttg ctcctgccga 1680

gaaagtatcc atcatggctg atgcaatgcg gcggctgcat acgcttgatc cggctacctg 1740

cccattcgac caccaagcga aacatcgcat cgagcgagca cgtactcgga tggaagccgg 1800

tcttgtcgat caggatgatc tggacgaaga gcatcagggg ctcgcgccag ccgaactgtt 1860

cgccaggctc aaggcgcgca tgcccgacgg cgaggatctc gtcgtgaccc atggcgatgc 1920

ctgcttgccg aatatcatgg tggaaaatgg ccgcttttct ggattcatcg actgtggccg 1980

gctgggtgtg gcggaccgct atcaggacat agcgttggct acccgtgata ttgctgaaga 2040

gcttggcggc gaatgggctg accgcttcct cgtgctttac ggtatcgccg ctcccgattc 2100

gcagcgcatc gccttctatc gccttcttga cgagttcttc tgagcgggac tctggggttc 2160

gaaatgaccg accaagcgac gcccaacctg ccatcacgat ggccgcaata aaatatcttt 2220

attttcatta catctgtgtg ttggtttttt gtgtgaatcg atagcgataa ggatccgcgt 2280

atggtgcact ctcagtacaa tctgctctga tgccgcatag ttaagccagc cccgacaccc 2340

gccaacaccc gctgacgcgc cctgacgggc ttgtctgctc ccggcatccg cttacagaca 2400

agctgtgacc gtctccggga gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg 2460

cgcgagacga aagggcctcg tgatacgcct atttttatag gttaatgtca tgataataat 2520

ggtttcttag acgtcaggtg gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt 2580

atttttctaa atacattcaa atatgtatcc gctcatgaga caataaccct gataaatgct 2640

tcaataatat tgaaaaagga agagtatgag tattcaacat ttccgtgtcg cccttattcc 2700

ctttttgcg gcattttgcc ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa 2760

agatgctgaa gatcagttgg gtgcacgagt gggttacatc gaactggatc tcaacagcgg 2820

taagatcctt gagagttttc gccccgaaga acgttttcca atgatgagca cttttaaagt 2880

tctgctatgt ggcgcggtat tatcccgtat tgacgccggg caagagcaac tcggtcgccg 2940

catacactat tctcagaatg acttggttga gtactcacca gtcacagaaa agcatcttac 3000

ggatggcatg acagtaagag aattatgcag tgctgccata accatgagtg ataacactgc 3060

ggccaactta cttctgacaa cgatcggagg accgaaggag ctaaccgctt ttttgcacaa 3120
catgggggat catgtaactc gccttgatcg ttgggaaccg gagctgaatg aagccatacc 3180
aaacgacgag cgtgacacca cgatgcctgt agcaatggca acaacgttgc gcaaactatt 3240
aactggcgaa ctacttactc tagcttcccg gcaacaatta atagactgga tggaggcgga 3300
taaagttgca ggaccacttc tgcgctcggc ccttccggct ggctggttta ttgctgataa 3360
atctggagcc ggtgagcgtg ggtctcgcgg tatcattgca gcactggggc cagatggtaa 3420
gccctcccgt atcgtagtta tctacacgac ggggagtcag gcaactatgg atgaacgaaa 3480
tagacagatc gctgagatag gtgcctcact gattaagcat tggtaactgt cagaccaagt 3540
ttactcatat atactttaga ttgatttaaa acttcatttt taatttaaaa ggatctaggt 3600
gaagatcctt tttgataatc tcatgaccaa aatcccttaa cgtgagtttt cgttccactg 3660
agcgtcagac cccgtagaaa agatcaaagg atcttcttga gatccttttt ttctgcgcgt 3720
aatctgctgc ttgcaaacaa aaaaaccacc gctaccagcg gtggtttgtt tgccggatca 3780
agagctacca actcttttc cgaaggtaac tggcttcagc agagcgcaga taccaaatac 3840
tgttcttcta gtgtagccgt agttaggcca ccacttcaag aactctgtag caccgcctac 3900
atacctcgct ctgctaatcc tgttaccagt ggctgctgcc agtggcgata agtcgtgtct 3960
taccgggttg gactcaagac gatagttacc ggataaggcg cagcggtcgg gctgaacggg 4020
gggttcgtgc acacagccca gcttggagcg aacgacctac accgaactga gatacctaca 4080
gcgtgagcta tgagaaagcg ccacgcttcc cgaagggaga aaggcggaca ggtatccggt 4140
aagcggcagg gtcggaacag gagagcgcac gagggagctt ccagggggaa acgcctggta 4200
tctttatagt cctgtcgggt ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc 4260
gtcagggggg cggagcctat ggaaaaacgc cagcaacgcg gccttttac ggttcctggc 4320
cttttgctgg ccttttgctc acatggctcg acagatcttc aatattggcc attagccata 4380
ttattcattg gttatatagc ataaatcaat attggctatt ggccattgca tacgttgtat 4440
ctatatcata atatgtacat ttatattggc tcatgtccaa tatgaccgcc atgttggcat 4500
tgattattga ctagttatta atagtaatca attacggggt cattagttca tagcccatat 4560
atggagttcc gcgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac 4620
ccccgcccat tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc 4680
cattgacgtc aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg 4740
tatcatatgc caagtccgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat 4800
tatgcccagt acatgacctt acgggacttt cctacttggc agtacatcta cgtattagtc 4860
atcgctatta ccatggtgat gcggttttgg cagtacacca atgggcgtgg atagcggttt 4920

gactcacggg gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac 4980

caaaatcaac gggactttcc aaaatgtcgt aacaactgcg atcgcccgcc ccgttgacgc 5040

aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctcgt ttagtgaacc 5100

gtcagatcac tagaagcttt attgcggtag tttatcacag ttaaattgct aacgcagtca 5160

gtgcttctga cacaacagtc tcgaacttaa gctgcagtga ctctcttaag gtagccttgc 5220

agaagttggt cgtgaggcac tgggcaggta agtatcaagg ttacaagaca ggtttaagga 5280

gaccaataga aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct 5340

attggtctta ctgacatcca ctttgccttt ctctccacag gtgtccactc ccagttcaat 5400

tacagctctt aaggctagag tacttaatac gactcactat aggctagcct cgagcgcgga 5460

gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 5520

tctgggcctc ccagtcctgg gcgccccacc acgcctcatc tgtgacagcc gagtcctgga 5580

gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg 5640

cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag 5700

gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 5760

tgtcctgcgg ggccaggccc tgttggtcaa ctcttcccag ccgtgggagc ccctgcagct 5820

gcatgtggat aaagccgtcg agggccttcg cagcctcacc actctgcttc gggctctgcg 5880

agcccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 5940

cactgctgac actttccgca aactcttccg agtctactcc aatttcctcc ggggaaagct 6000

gaagctgtac acaggggagg cctgcaggac aggggaccat catcaccatc accattgat 6059